

Societies the publications of the Royal Society are sent gratuitously; there is no difficulty in obtaining access either to the libraries or to the reading-rooms when the members are in London, for the reason that all necessary knowledge as to how these privileges are to be obtained is of course possessed by those at home, whereas the member of a colonial Society who finds himself in England is in a very different position. He may know nobody, he may not know even of the existence of the facilities afforded, and he may leave England without having been present at any meetings of the Society, and without the knowledge that almost anyone who chooses can attend them. We are glad then on these and on other grounds that the question has been raised, and we believe that great good may be accomplished by acting on Prof. Huxley's suggestion.

SUPERNORMAL PSYCHOLOGY

Phantasms of the Living. By Edmund Gurney, Frederic W. H. Myers, and Frank Podmore. (London: Trübner and Co., 1886.)

UNDER the title "Phantasms of the Living," three of the leading members of the Society for Psychical Research have presented to the world at large, in two bulky volumes running to upwards of 1400 pages, the evidence they have collected in support of the hypothesis of telergy and telepathy, or the influence of one mind on another, near or at a distance, without the intervention of the ordinary channels of sense. The division of labour, for such we may truly term it, seems to have been as follows: Mr. F. W. H. Myers writes an introduction and a concluding chapter on "A Suggested Mode of Psychical Interaction"; Mr. Edmund Gurney is responsible for the compilation of the body of the work, the presentation and criticism of the evidence; while in the collection of evidence and examination of witnesses Mr. Podmore "has borne so large a share, that his name could not possibly have been omitted from the title-page."

It is a matter of peculiar difficulty to do justice, in the space that NATURE can place at my disposal, to a work of such portentous bulk, one written in such obvious good faith, one on which the authors have bestowed so much time, labour, and thought, and yet one presenting views which no one who has learnt to believe in the parallelism or identity of neuroses and psychoses can accept without abjuring his scientific and philosophic faith. I hold it to be the duty of a reviewer not merely to air his own opinions, but to give his readers a sketch of the contents of the volumes before him. But how can one sketch in two or three columns so vast a mass of evidence, the chief value of which is, we are told, its cumulative nature? And if the reviewer owes it to his readers to present some sort of outline of the picture his author presents, he none the less owes it to himself, his author, and his journal, to endeavour to estimate the value of the original thus roughly outlined. Difficult as the task is, it must be faced.

The evidential part of the work opens with a record of cases which form, it is held, an experimental basis for thought-transference. The following description is given

by the Rev. H. M. Creery of experiments with his own daughters:

"Each went out of the room in turn, while I and the others fixed on some object which the absent one was to name on returning to the room. We began by selecting the simplest objects in the room, then chose the names of towns, dates, cards out of a pack, &c. I have seen seventeen cards, chosen by myself, named right in succession, without a mistake."

In similar experiments the investigating committee acted as agents. This excluded, in their opinion, the possibility of trickery. Tabulating the results thus obtained, they submitted them to Mr. F. Y. Edgeworth, who applied to them the calculus of probabilities, obtaining "a row of *thirty-four nines* following a decimal point," or practical certainty in favour of their being due either to collusion or to thought-transference.

Details are given of experiments on the transference of tastes under conditions which, in the opinion of the authors, precluded the possibility of collusion or deception. The following are a few successive results:—

Substances tasted	Answers given
Vinegar	A sharp and nasty taste.
Mustard	Mustard.
Sugar	I still taste the hot taste of the mustard.
Worcestershire sauce	Worcestershire sauce.
Port wine (quality not stated !)	Between eau-de-cologne and beer.
Bitter aloes	Horrible and bitter.

Instances of the localisation of pains are given. "The percipient being seated, blindfolded, and with her back to the rest of the party, all the other persons present inflicted on themselves the same pain in the same part of the body. Those who took part in the collective agency were three or more of the following: Mr. Malcolm Guthrie, Prof. Herdman, Dr. Hicks, Dr. Hyla Greves, Mr. R. C. Johnson, F.R.A.S., Mr. Birchall, Miss Redmond, and, on one occasion, another lady. The percipient throughout was Miss Relf. In ten out of twenty cases the percipient localised the pain with great precision; in seven, the localisation was nearly exact; in two, no local impression was perceived; and in one, the last, the answer was wholly wrong."

Facsimiles are given of pictures reproduced by thought-transference. In a continuous series of six—none of which can be said to have been complete failures—two were reproduced by the percipient with great fidelity; even the comparative failures are instructive from their partial success. The position of the agent, we are told, rendered it absolutely impossible that she should obtain a glimpse of the original.

Such is some of the experimental evidence for thought-transference. Readers of NATURE will understand why this section of the authors' work, giving results obtained under conditions within control, is noticed at greater length than can be devoted to other branches of the evidence.

The next chapter deals with cases transitional between experimental thought-transference—in which both agent and percipient are voluntarily taking part with a definite idea of certain results in view—and spontaneous telepathy, where neither has voluntarily or consciously formed an idea of any result whatever. These transitional cases are

those in which the agent acts consciously and voluntarily, but the percipient is not consciously or voluntarily a party to the experiment. Of these cases, a single example must suffice. Two fellow-students of naval engineering at Portsmouth had been in the habit of making experiments in mesmerism. One, ere long, acquired mesmeric control over the other, who was able to see, in the mesmeric trance, places in which he was interested, if he resolved to see them before he was hypnotised. One day he expressed a wish to see a young lady living in Wandsworth. He was hypnotised; and when he came round, he said he had seen her in the dining-room. A few days afterwards, the experiment was repeated. He saw, as he lay entranced, the young lady in a room with her little brother; she fell back in her chair in a sort of faint. A letter was subsequently received from the young lady, dated the morning following the last experiment, beginning: "Has anything happened to you?" and stating that "she could have declared she saw him looking at her" on two occasions, on the latter of which she was so frightened that she nearly fainted. "Luckily," she adds, "only my brother was there, or it would have attracted attention." Although there is some discrepancy as to the date of the first appearance, the second (January 18, 1886) is accordant.

After the enumeration of fifteen or sixteen transitional cases, Mr. Gurney devotes a chapter to a general criticism of the evidence (to which is added an appendix on witchcraft), and then gives a chapter of specimens of the various types of spontaneous telepathy. For these types and their various sub-classes, the reader must be referred to the work itself. I must here again content myself with quoting a single case (which is both "reciprocal" and "collective") from among the 700 or so that are given.

"On the evening of, I think, March 23, 1883," writes a Mrs. Bettany, of Dulwich, "I was seized with an unaccountable anxiety about a neighbour. I tried to shake off the feeling, but I could not; and after a sleepless night, in which I constantly thought of her as dying, I decided to send a servant to the house to ask if all were well." (This is confirmed by the servant.) "The answer I received was, 'Mrs. J. died last night.' Her daughter afterwards told me that the mother had startled her by saying, 'Mrs. Bettany knows I shall die.'"

Mrs. Bettany adds:—"My cook, to whom I had not mentioned my presentiment, remarked to me on the same morning: 'I have had such a horrible dream about Mrs. J., I think she must be going to die.' She distinctly remembers that some one (she does not know *who*, and I think never did) told her in her dream that Mrs. J. was dead." (This is also confirmed by the cook.)

Of somewhat analogous cases of phantasms, presentiments, or dreams occurring to one or more percipients at or shortly after the death of the agent, there is a surprising but wearisome abundance.

So much for the evidence. The authors are fully alive to its liability to error. But they note that their "somewhat persistent and probing method of inquiry has usually repelled the sentimental or crazy wonder-mongers who hang about the outskirts of such a subject as this; while it has met with cordial response from an unexpected number of persons who feel with reason that the very mystery which surrounds these incidents makes it

additionally important that they should be recounted with sobriety and care."

We turn now to the theory; and though Mr. Gurney tells us that the character of the present work is mainly evidential, there is no lack of theory scattered up and down throughout its multitudinous paragraphs. The authors, it need hardly be said, regard their hypothesis as strictly scientific. "We wish distinctly to say," writes Mr. Myers, "that so far from aiming at any paradoxical reversion of established scientific conclusions, we conceive ourselves to be working (however imperfectly) in the main track of scientific discovery."

We must, however, carefully separate the views of Mr. Myers from those of Mr. Gurney. Both of them, of course, insist on the reality of experimental thought-transference and of spontaneous telepathy—the radical difference between which is well brought out. In the one an object or sensation kept steadily before the mind of the agent or agents is transmitted as such to the mind of the percipient; in the other the case is different: not the death-swoon of the agent, but the image of the agent as dying is transmitted. And here it is that our authors begin to part company. Calling to mind the facts (or supposed facts) (1) that the dying man may have in intervals of consciousness a vivid mental picture of himself and his surroundings; (2) that most of us have in the background of consciousness a tolerably well-developed conception of our own proper selves; (3) that there is some experimental evidence of collective telepathic influence, so that the percipient may be jointly influenced by the dying man as principal agent, and by the bystanders at the death-bed as subsidiary agents—taking these, avowedly or implicitly, into consideration, Mr. Gurney does not feel forced to go beyond the theory of thought-transference. Not so Mr. Myers. He rises boldly into what looks uncommonly like spiritualism, and accepts clairvoyance, where the percipient "seems to visit scenes, or discern objects, without needing that those scenes or objects should form a part of the perception or memory of any known mind." "*Correspondently with clairvoyant perception*," he says (the italics are his own), "*there may be phantasmogenic efficacy*," which in plain English means that the percipient may visit in spirit scenes he has never visited in the flesh, and that his spirit may be visible as a phantasm to the human occupants of these scenes. And in support of his view he adduces such cases as that of the two students which I have summarised above.

On the question of the physical aspect of the psychical phenomena, again, our authors do not agree. Mr. Gurney holds that "mental facts are indissolubly linked with the very class of material facts that science can least penetrate—with the most complex sort of changes occurring in the most subtly-woven sort of matter—the molecular activities of brain-tissue." And though he subsequently says: "Not only, as with other delicate phenomena of life and thought, is the *subjective* side of the problem the only one that we can yet attempt to analyse: we do not even know where to look for the *objective* side:" he rather advocates the limitation of the question for the present to the psychical aspect, than dismisses the physical as a piece of unwarrantable materialism. But Mr. Myers goes further: "The psychical element, I

repeat, must henceforth almost inevitably be conceived as having relations which cannot be expressed in terms of matter." And again: "I claim at least that any presumption which science had established against the possibility of spiritual communion is now rebutted; and that the materialist must admit that it is no longer an unsupported dream, but a serious scientific possibility, that, if any intelligences do in fact exist other than those of living men, influences from those intelligences may be conveyed to our own mind."

And now, in conclusion, what shall we say of these ponderous tomes? Shall we lightly dismiss the whole subject as a "pack of nonsense"? I do not think that this would be a wise or a scientific procedure. Speaking for myself, I must confess that, in my opinion, Mr. Myers's views are not "on the main track" of the science of to-day, whatever relation they may hereafter be shown to bear to the science of the future. Speaking for myself again, I am ready to accept experimental thought-transference as a working hypothesis, that is to say, a guide to future research on the subject. It may be that any physical explanation we can at present offer is no nearer the truth than was the Ptolemaic hypothesis in astronomy, and yet such a working hypothesis may be valuable in the existing state of psychology. With regard to spontaneous telepathy, notwithstanding the large amount of evidence so carefully collected and criticised, notwithstanding that I have first-hand evidence more convincing (to me) than anything recorded in these volumes, I prefer to credit the whole to a suspense account. The physical difficulties are enormous. We have to conceive the action of brain on brain across a whole hemisphere. Not that this must be pressed too far. There is much that is provisionally accepted by science (much anent ether, and atoms, and modes of molecular action) that I find it exceedingly hard to conceive. And perhaps the distant action of brain on brain is not harder for us to conceive than would be the transmission of luminiferous waves to beings in whom the visual sense was not as yet recognised, and who, hitherto only acquainted with auditory vibrations transmitted by the air, were called upon to believe that waves could be transmitted by the ether from distant stars, and could pass almost unchecked through thick masses of solid material. Still, though the mass of evidence is considerable, and though the physical difficulties must not be pressed too far, I am not prepared fully to accept the doctrine of spontaneous telepathy. At the same time, I hold that the evidence adduced by earnest workers is not to be met by easy and ignorant ridicule. I do not think that science is best served by those who are ever ready to throw the cold water of impossibility on the light of new ideas struggling into existence.

I am, moreover, strongly of opinion that normal psychology has much to learn from experiments on supernormal and abnormal "subjects." Beneath the threshold of consciousness there is a vast amount of sub-conscious and unconscious mental action. Of the multitudinous simultaneous neuroses only the superficial film (so to speak) emerge into the light of consciousness as psychoses. The study from the psychological standpoint of the underlying *hypopsychoses*, as I have elsewhere suggested that they should be termed, is as important as it is difficult. If the

result of such work as Messrs. Gurney, Myers, and Podmore have entered upon aids in throwing light upon these hidden mysteries, which are none the less realities, of the human mind, their labour will, in my opinion, not have been in vain.

C. LLOYD MORGAN

ELEMENTARY RESULTS IN PURE MATHEMATICS

A Synopsis of Elementary Results in Pure Mathematics, &c. By G. S. Carr, M.A. Pp. xxxviii. + 936 + 20 folding Plates of Figures. (London: Francis Hodgson, 1886.)

[I]N our last notice of this work (vol. xxxi. p. 100) we gave an account of Sections X., XI., and XII. The complete volume contains two additional sections. The first of these treats of plane co-ordinate geometry, under which heading we have systems of co-ordinates, analytical conics in Cartesian and trilinear co-ordinates (we miss the m equations for the parabola and the corresponding equations for chords, &c.). In the latter division we have, amongst the particular conics considered, the triplicate-ratio and seven-point circles (or, as they are more usually styled, the Lemoine and Brocard circles). The account is carefully drawn up from original authorities, and will help to bring this latest development of the geometry of the circle and triangle more into notice. At present this and Dr. Casey's books are the only source readily accessible to students. We are promised another presentment of these circles shortly, but of this more anon. The concluding portion of this section is devoted to the theory of plane curves. Here we have, *inter alia*, inverse and pedal curves, roulettes, and the various forms of transcendental curves. Considerable space is taken up with linkages and link-works: here we have accounts of Kempe's five-bar linkage, the six-bar inversor, the eight-bar double inversor, the quadruplane, the isoklinostat, the planimeter, and the pantograph (this Mr. Carr generally calls pentograph—evidently he has not consulted the "English Cyclopædia"—and in one place only, pantograph). The concluding section is mainly taken up with solid co-ordinate geometry, the final articles being devoted to Guldin's rules, moments and products of inertia, perimeters, areas, volumes, &c. Here we have the theorems which go by the names of Fagnani, Lambert, and Griffiths (not Griffith, as the "Contents" and "Index" print the name; the text, § 6096, is right).

We have in our former notices sufficiently indicated our opinion of the utility of such a book as this if thoroughly trustworthy, and have suggested that a student should have this synopsis by his side when he is carefully going through his subject, that so he may be able to spot any slight inaccuracy in the text. We believe the book is singularly free from errors, but it would be absurd to suppose that there are not several which have escaped even the notice of the author, who has imposed upon himself numerous guards for the prevention of such slips. For it must be remembered that this is no hastily-prepared work: it has occupied much of the writer's time since 1866, when the *magnum opus* was commenced. The author is to be heartily congratulated on the successful